



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/523,642	11/17/2005	Alexia Balland-Longeau	355901-7300	1261
30827	7590	10/30/2007		
MCKENNA LONG & ALDRIDGE LLP 1900 K STREET, NW WASHINGTON, DC 20006			EXAMINER HEINCER, LIAM J	
			ART UNIT	PAPER NUMBER
			4134	
			MAIL DATE	DELIVERY MODE
			10/30/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.		Applicant(s)	
	10/523,642		BALLAND-LONGEAU ET AL.	
	Examiner		Art Unit	
	Liam.J. Heincer		4134	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 February 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☒ Claim(s) 2 and 11 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>4/2005</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

Acknowledgment is made of applicant's claim for foreign priority based on an application filed in France on August 6, 2002. It is noted, however, that applicant has not filed a certified copy of the 02/10008 application as required by 35 U.S.C. 119(b).

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 2 and 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Considering Claim 2: A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 2 recites the broad recitation "greater than or equal to 50,000", and the claim also recites "preferably from 50,000 to 150,000" which is the narrower statement of the range/limitation.

Claim 2 also claims a molecular weight for the polymer without giving units or specifying if the molecular weight is a weight average or number average molecular weight. For

Art Unit: 4134

the purpose of further examination the molecular weight is being interpreted as being a weight average molecular weight with units of g/mol.

Considering Claim 11: In the present instance, claim 11 recites the broad recitation "a group borne by W₂", and the claim also recites "possibly being an F, -O-SO₂-Aryl or -S(O)-Aryl group" which is the narrower statement of the range/limitation.

Claim Rejections - 35 USC § 103

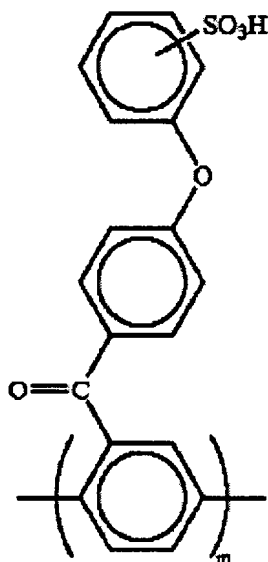
The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-5, 7, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Asano et al. (US 2002/0172850) in view of Marrocco, III et al. (US Pat. 5,789,521).

Considering Claim 1, 3, 7 and 8: Asano et al. teaches a polymer with a repeat unit of



(¶0033)

Asano et al. does not teach a repeat unit of formula II. However, Marrocco, III et al. teaches a copolymer (9:14-20) which consists of at least one repeat unit that is a poly-1,4-phenoxybenzoylphenylene (18:42-60)) at least one repeat unit that is a fluorinated (11:41-51) poly-1,4-benzoylphenylene (13:50-62). Asano et al. and Marrocco, III et al. are combinable as they are concerned with the same field of endeavor, namely phenylene polymers. It would have been obvious to a person having ordinary skill in the art at the time of the invention to have used the poly-1,4-benzoylphenylene repeat unit of Marrocco, III et al. in the polymer of Asano et al., and the motivation to do so would have been as Marrocco, III et al. suggests, to provide a greater solubility to the polyphenylene (11:5-23).

Considering Claim 2: Asano et al. teaches the molecular weight as being greater than 50,000 (¶0432).

Considering Claim 4: Asano et al. teaches a block copolymer (¶0434).

Considering Claim 5: Asano et al. teaches a two component copolymer where the sulphonated unit comprises 50 to 60 mol% of the polymer (¶0027).

Considering Claims 12 and 13: Asano et al. teaches the use of the polymer as membrane for use in a fuel cell (¶0002).

Claims 1-5, 7, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marrocco, III et al. (US Pat. 5,789,521) in view of Charnock et al. (WO 01/70858).

Considering Claims 1, 3, 7 and 8: Marrocco, III et al. teaches a copolymer (9:14-20) which consists of at least one repeat unit that is a poly-1,4-phenoxybenzoylphenylene (18:42-60)) at least one repeat unit that is a fluorinated (11:41-51) poly-1,4-benzoylphenylene (13:50-62).

Marrocco, III et al. does not teach the poly-1,4-phenoxybenzoylphenylene unit as having a one of the claimed constitutes on the pendent aryl group. However, Charnock et al. teaches sulfonating, phosphorylating, or carboxylating (5:5-10) a poly-1,4-phenoxybenzoylphenylene (3:20-22, Figure 3b). Marrocco, III et al. and Charnock et al. are combinable as they are concerned with the same field of endeavor, namely phenylene polymers. It would have been obvious to a person having ordinary skill in the art at the time of the invention to have sulfonated, phosphorylated, or carboxylated the poly-1,4-phenoxybenzoylphenylene repeat unit of Marrocco, III et al. as in Charnock et al., and the motivation to do so would have been, as Charnock et al. suggest, to provide ion exchange sites on the polymer (5:5-10).

Considering Claim 2: Marrocco, III et al. teaches the molecular weight as being greater than 50,000 (19:26-30).

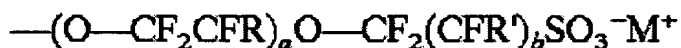
Considering Claim 4: Marrocco, III et al. teaches the polymer as being random, block/alternating, or sequential (9:13-20).

Considering Claim 5: Marrocco, III et al. teaches a head to tail, or head to head copolymer (9:13-20). Therefore there would be substantially the same mol% of each repeat unit/40 to 50 mol% of formula I and 60 to 50 mol% of formula II.

Claims 6, 9, and 10 rejected under 35 U.S.C. 103(a) as being unpatentable over Asano et al. (US 2002/0172850) in view of Marrocco, III et al. (US Pat. 5,789,521) as applied to claim 1 above, and further in view of Doyle et al. (US Pat. 6,025,092).

Considering Claims 6, 9, and 10: Asano et al. and Marrocco, III et al. collectively teach the polymer of claim 1 as shown above.

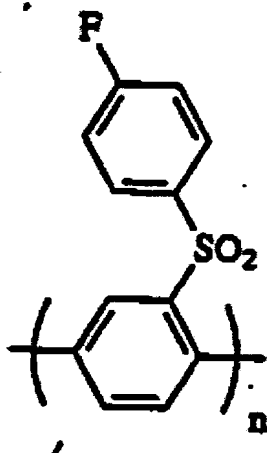
Asano et al. does not teach the pendant acid as being of the claimed type. However, Doyle et al. teaches using a pendant group of



in an ion exchange membrane (2:46-55). Asano et al. and Doyle et al. are combinable as they are concerned with the same field of endeavor, namely ion exchange membranes. It would have been obvious to a person having ordinary skill in the art at the time of the invention to have used the pendant group of Doyle et al. in the place of the sulphonic acid of Asano et al., and the motivation to do so would have been, as Asano et al. suggest, the excellent proton conductivity of the perfluorinated polymer electrolytes (¶0005).

Claims 1 and 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bloom et al., Functional Derivatives of Poly(4'-Fluoro-2,5-Diphenylsulfone via Nucleophilic Aromatic Substitution) in view of Charnock et al. (WO 01/70858).

Considering Claim 11: Bloom et al. teaches a process for producing a polymer comprising reacting a base polymer of



with a hydroxyl functional aromatic group (Scheme 1). Bloom et al. also teaches the aromatic group as containing functional groups to alter the properties of the base polymer (Conclusion).

Bloom et al. does not teach the functional group as being one of the claimed acids. However, Charnock et al. teaches a sulfonated, phosphorylated, or carboxylated (5:5-10) poly-1,4-phenoxybenzoylphenylene (3:20-22, Figure 3b). Bloom et al. and Charnock et al. are combinable as they are concerned with the same field of endeavor, namely phenylene polymers.

Art Unit: 4134

It would have been obvious to a person having ordinary skill in the art at the time of the invention to have sulfonated, phosphorylated, or carboxylated the polymer of Bloom et al. as in Charnock et al., and the motivation to do so would have been, as Charnock et al. suggest, to provide ion exchange sites on the polymer (5:5-10).

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. See PTO Form 892.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Liam J. Heincer whose telephone number is 571-270-3297. The examiner can normally be reached on Monday thru Friday 7:30 to 5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Eashoo can be reached on 571-272-1197. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LJH


MARK EASHOO, PH.D.
SUPERVISORY PATENT EXAMINER

26/04/07

October 12, 2007